CHAPTER 13-3 FEASIBILITY STUDIES

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13-3.1 INTRODUCTION

A. OVERVIEW - A feasibility study is to be developed, as part of the overall planning process, to identify the best alternatives to meet program requirements in existing facilities. These requirements are set forth in the Program of Requirements (POR), Program Justification Document (PJD), or other document which adequately describes the program need. A feasibility study should be developed in instances where an ongoing program is being significantly changed or expanded. It should also be done when it is contemplated that an existing, new, or expanded program will be operated from other existing buildings or facilities. A feasibility study can be generated using a rough draft POR.

The purpose of this chapter is to specify the report format and identify considerations to be addressed in evaluating the feasibility of continued use of existing or other facilities. This chapter provides a guideline for developing scope of services for architectural and/or engineering (A/E) consultants. It is the responsibility of those conducting the study to apply specific criteria, applicable codes, and other pertinent considerations. Completed feasibility studies of other facilities which are deemed acceptable, can be made available to the consultants for additional direction. An Appendix A - Scope of Work is an example of an A/E contract scope of work.

B. CODES AND REGULATIONS - The current editions of the following documents shall be utilized in assessing existing facilities, or for developing new facilities:

(1) Americans with Disabilities Act (ADA) Standard
(2) National Electrical Code
(3) Uniform Building Code
(4) NFPA 101 Life Safety Code and other applicable NFPA Standards
(5) IHS Health Facilities Planning Manual and Technical Guidance
(6) National Standard Plumbing Code
(7) Uniform Mechanical Code
(8) Guidelines for Construction and Equipment of Hospitals and Medical Facilities, AIA

C. OTHER GUIDES

IHS Technical Handbook for the Environmental Health and Engineering, Volume II, Part 13, Chapter 13-4, "Site Selection Report."

13-3.2 ASSESSMENT OF EXISTING FACILITIES AND SERVICES

INTRODUCTION - The organization requesting a feasibility study shall provide a statement of program requirements which delineates the type, range, and number of services to be provided, including space requirements and any other special needs or considerations. If possible, the desired design or service life for the facility shall be indicated.

The study shall contain information and assessment of the existing structures or buildings, sites, utilities, access, support services, historical significance, and other relevant factors. The following areas should be specifically addressed for each of the above:

A. Existing facilities: Descriptive information, including building footprint and orientation, floor plan, building gross area, current space utilization, and the availability of updated and accurate "as-built" drawings shall be summarized. The facilities shall be evaluated for structural integrity, adequacy of the electrical and mechanical systems, architectural considerations, and compliance with applicable codes and regulations consistent with the proposed usage. If there are space limitations or inadequacies noted in the existing building, alternatives for expansion should be identified for consideration.

B. Site evaluation: Descriptive information shall be provided to include the following: area and site maps; land status; site characteristics such as terrain, soil type, vegetation, drainage, and flood hazard; site utilities (water, sewer, electrical, communications, fuel, etc.); and traffic circulation, parking and site access. Each of these elements shall be evaluated for adequacy in meeting the requirements of the proposed use. The scope of work of any recommended improvement(s) to the site, with preliminary cost estimate(s), shall be provided. Reference IHS Technical Handbook for Environmental Health and Engineering, "Site Selection Report."

C. Availability of utilities and access to site: Descriptive information on all utilities serving or available to the site and access roads shall be provided. The adequacy and reliability of the existing utilities, and site accessibility, shall be evaluated in context of the proposed facility usage. If existing utilities or access require upgrading or expansion, the scope(s) of work and preliminary cost estimate(s) associated with the required improvements shall be identified.

D. Availability of support services: Descriptive information on the availability of fire protection, law enforcement, housing, schools, shopping, transportation, alternate and standby power, and other services which are necessary for the operation of the proposed facility or program shall be provided. The adequacy of

the essential support services shall be evaluated relative to the proposed program requirements.

E. Disposal of Existing Facility: If the existing facility cannot accommodate the planned programs, specific recommendations shall be made on effective use of the existing facility, such as converting it to a nursing home, apartments, or offices; disposing of the property; demolition; etc.

13-3.3 ALTERNATIVES FOR PROVIDING REQUIRED SERVICES

A. EVALUATION OF ALTERNATIVES - If possible, at least three alternative approaches to implement Program of Requirements (POR) in the existing facility shall be developed in the report. These may include innovative reconfiguration of the existing space, renovation, or expansion of the facility. Each alternative shall consider the cost impact of phased construction and disruption of services. Proposed space utilization plans or layouts, and sufficiently detailed, comparative, budget cost estimates for each of the proposed alternatives, shall be presented. The cost estimates shall also be compared with a cost estimate for new construction to serve the POR. It is preferred that the IHS Budget Cost Estimating System be used. However, if a different cost estimating system is used, it shall be noted and described. Total gross floor areas of the existing facilities shall be compared with the total gross square areas in the POR. Facilities or spaces considered for renovation should meet the program needs of the proposed facility. The cost of the renovated or adapted space shall not exceed that of the authorized program.

B. PREFERRED ALTERNATIVE - The cost-effective alternative, including life cycle cost, shall be identified. The advantages and disadvantages of all alternatives considered in determining the preferred alternative shall be discussed. In some cases, the preferred alternative may be new construction.

13-3.4 PREPARATION OF THE REPORT

A. ORGANIZATION OF STUDY - The study shall state the organizational component for whom it is being conducted, and shall cite relevant authorizations for conducting the work. The study shall provide an executive summary outlining recommendations, issues and evaluations, and methods utilized. This study shall be followed by excerpts from the Program of Requirements document which establishes the basis for the study, a narrative description of the existing facilities or property, and in-depth discussion of the alternatives considered. An appendix should include relevant calculations, observations, data, photographs, and other supporting material developed or utilized in the study. In most instances, six copies of the study shall be provided to the requesting agency.

B. EXHIBITS - The report shall contain photographs and/or drawings, floor plans of existing buildings and other key structures on the

site, site maps, and area or vicinity maps. Also include drawings of the developed alternatives for the site and facility, tables of gross floor areas compared with gross floor areas in the Program of Requirements, and a budget cost estimate for each alternative. If there are significantly different annual operating costs among the alternatives, a discussion of operation and maintenance costs shall also be added.

A "Logic/Factors Comparison" matrix for the various alternatives may be included as an exhibit. The matrix will facilitate comparing the factors, both subjective and objective, to determine the preferred alternative. The results shall be presented in the report. **Table A** illustrates how the matrix is used. Care must be exercised in selecting the factors for each specific project, to ensure their applicability.

Additional subjective factors related to constructibility and to long-term, natural, built, socioeconomic, and environmental impacts should be addressed, as appropriate. These factors will be assigned a weighted numeric evaluation as follows:

(1) Each factor will be assigned a weight factor (W) according to its relative importance. A range of 0 to 10 is suggested, with 10 being the most important.

(2) The relative degree of environmental impact, functionality, constructibility, etc. is assigned for each alternative, and a numeric degree value (V) is assigned to each factor for that alternative. A range of values from -10 to +10 is suggested. Negative values are for negative impact, and positive values are for positive impact.

(3) The weighted numeric evaluation score (WNES) is the product of the weight times the value.

(4) The sum of weighted numeric evaluation scores for each factor provides a total score for each alternative.

C. SAMPLE REPORT - Past feasibility studies will be available from the Engineering Services.

TABLE A

SAMPLE LOGIC/FACTOR COMPARISON MATRIX							
FACTORS		ALT. 1		ALT. 2		ALT. 3	
OBJECTIVE FACTORS:							
Gross square meters(m^2)		3500		3400		2800	
Fire rating		Marginal		Average		Excellent	
Cost estimate ($000)		1,378		1,284		1,123	
SUBJECTIVE FACTORS:	W	V	WNES	V	WNES	V	WNES
Adequacy of space[F]	3	+3	9.00	0	0.00	-1	0.00
Dept. relationships[F]	2	-1	-2.00	+1	2.00	+3	2.00
Patient monitoring[C]	3	-2	-6.00	+3	9.00	-1	9.00
Security[C]	2	+3	6.00	-1	-2.00	0	-2.00
Ability to expand[C]	1	+3	3.00	-3	-3.00	0	-3.00
Construction period[C]	3	-1	-3.00	+3	9.00	-3	9.00
		TOTAL	7.00		15.00		15.00

NOTES

F - Functional consideration C - Constructibility consideration

APPENDIX A - SCOPE OF WORK

A. SCOPE - Provide all professional consulting services necessary to develop a feasibility study for **[name of facility, location]**.

The feasibility study will be based on the Program of Requirements (POR), Attachment #1, and data gathered on-site at the existing facility.

B. INTRODUCTION - The feasibility study is to be developed as part of the overall planning process for identification of the best alternative to implement program requirements within the existing facility. These requirements are set forth in the Program of Requirements (POR), Attachment #1; and Program Justification Document (PJD), Attachment #2.

C. GENERAL - The study shall identify the organization for whom the study is being conducted, and shall cite relevant authorizations for conducting the work.

D. SERVICES

(1) **ASSESSMENT OF EXISTING FACILITIES AND SERVICES**

The study shall include information on, and an assessment of, the existing structure or buildings, site, utilities, access, and support services. The following areas should be specifically addressed for each of the above:

a) Existing facilities - Descriptive information, including building footprint and orientation, floor plan, current space utilization, and the availability of accurate "as-built" drawings shall be summarized. The overall condition of the facilities shall be evaluated for structural integrity, adequacy of the electrical and mechanical systems, and architectural considerations in relation to applicable codes and regulations consistent with the proposed usage. If there are space limitations or inadequacies noted in the existing building, alternatives for expansion should be identified.

b) Site evaluation - Descriptive information including area and site maps; land status; site characteristics such as terrain, soil type, vegetation, drainage, and flood hazard; site utilities (water, sewer, electrical, communications, fuel, etc.); and traffic circulation and parking shall be provided, and each shall be evaluated for adequacy in meeting the requirements of the proposed use. The scope of any recommended improvements to the site, including preliminary cost estimates, shall be provided.

c) Availability of utilities and access to site - Descriptive information on all utilities (water, sewer, solid waste disposal, electrical, communications, fuel, etc.), serving, or available to, the site and access roads to the site, shall be provided. The adequacy of the existing utilities and access to the site shall be evaluated in context of the proposed facility usage. If existing utilities or access require upgrading or expansion, the scope of work and preliminary costs associated with the required improvements shall be identified.

d) Availability of support services - Descriptive information on the availability of fire protection, law enforcement, housing, schools, shopping, transportation, alternative and standby power, skilled workforce, and other services which are necessary for operating the proposed facility or program shall be provided. The adequacy of the essential support services shall be evaluated in context of the proposed program requirements.

(2) **ALTERNATIVES FOR PROVIDING REQUIRED FACILITIES**

At least three alternatives for renovation or expansion of the facility to meet project requirements, as applicable, shall be developed and presented in the study. For comparison purposes, a baseline budget estimate for new construction shall also be provided. Proposed space utilization plans or layouts, including budget cost estimates (prepared in sufficient detail to allow comparison of alternatives) for each of the developed alternatives shall be presented. If there are discernable cost differences in the overall operations and maintenance or energy costs for the facility, those costs shall be presented and discussed. Provide a comparison of required square meters of each alternative, taking into consideration all special program requirements such as security, etc.

(3) **PREFERRED ALTERNATIVE**

The cost-effective alternative, considering life cycle cost, shall be identified; and the advantages and disadvantages of all alternatives considered in arriving at the preferred alternative shall be presented. If none of the considered alternatives are deemed feasible, a separate study and justification for the provision of a new or replacement facility will be necessary, and will be done under a separate contract. If the existing facility cannot accommodate the planned programs, specific recommendations shall be made on effective use of the existing facility, such as converting it to a nursing home, apartments, or offices; disposing of the property; demolition; etc.

(4) **EXHIBITS**

The report shall include pictures or drawings of existing buildings and other key structures on the site; pictures or maps of the site; and an area or vicinity map. Drawings of the developed alternatives for both site and facility, and a budget cost estimate for the development of each alternative, shall be included. If significantly different operating and maintenance costs are identified in the study, exhibits, and calculations, these shall also be included.

Refer to TABLE A on page (13-3) 8, a "Logic/Factors Comparison" matrix for the various alternatives, and include it in the report.